

## CLAIMS

- 1    1.    A process for forming a preform for use in a composite structure having  
2    at least one curved portion of a specific length, the process comprising the  
3    steps of:
  - 4        providing a preform capable of expanding the length of the threads in  
5        rows parallel to the direction of curvature over a length equal to the length  
6        requiring curvature, and
  - 7        stretching the portions of the preform requiring curvature in a sine-  
8        wave pattern.
- 1    2.    The process as set forth in claim 1 wherein the preform is made of  
2    woven material.
- 1    3.    The process as set forth in claim 2 wherein the step of providing a  
2    preform capable of expanding the length of the threads in rows parallel to the  
3    direction of curvature over a length equal to the length requiring curvature  
4    includes the step of forming the preform with discontinuous threads in rows  
5    parallel to the direction of curvature over a length equal to the length  
6    requiring curvature, such that the gaps between each thread row are spaced  
7    from the gaps in the adjacent tread rows.

1       4.     The process as set forth in claim 2 wherein the step of providing a  
2     preform capable of expanding the length of the threads in rows parallel to the  
3     direction of curvature over a length equal to the length requiring curvature,  
4     such that the gaps between each thread row are spaced from the gaps in the  
5     adjacent tread rows includes the steps of:

6              providing a preform having continuous threads; and

7              cutting the treads parallel to the direction of curvature into over a  
8     length equal to the length of the length requiring curvature, such that the cuts  
9     in each thread are spaced from the cuts in the adjacent treads.

1       5.     The process as set forth in claim 1, or 2, or 3, or 4, wherein the step of  
2     step of stretching the portions of the preform requiring curvature in a sine-  
3     wave pattern includes forming is accomplished in a sine wave shaped die.

1       6.     The process of claim 5 wherein the preform is a 3D woven PI shaped  
2     cross-section preform having first and second foot portions and first and  
3     second upstanding leg portions for use in a structure having at least one  
4     curved portion of a specific length.

1       7.     A process for forming a 3D woven PI shaped cross-section preform  
2     having a first and second foot portions and first and second upstanding leg  
3     portions for use in a structure having at least one curved portion of a specific  
4     length, the process comprising the steps of:

5              cutting the treads parallel to the direction of curvature into over a length  
6     equal to the length, such that the cuts in each thread are spaced from the cuts  
7     in the adjacent treads;

8              stretching the portions of the preform requiring curvature.

1       8.     The process as set forth in claim 7 comprising the step of forming the  
2     curvature in the preform.

1    9.    The process as set forth in claim 8 including the step of impregnating  
2    the preform prior to the step of cutting the treads parallel to the direction of  
3    curvature into over a length equal to the length, such that the cuts in each  
4    thread are spaced from the cuts in the adjacent treads.

1    10.   The process as set forth in claim 9 wherein the step of stretching the  
2    portions of the preform requiring curvature is accomplished by forming a  
3    sine-wave pattern in the portions of the preform requiring curvature.

1    11.   The process as set forth in claim or 7, or 8, or 9, or 10, wherein prior  
2    to the step of cutting the treads parallel to the direction of curvature into over  
3    a length equal to the length, such that the cuts in each thread are spaced  
4    from the cuts in the adjacent treads, the step of folding the first and second  
5    upstanding leg portions over the first and second bottom foot portions.